NEI Recommendations for Reflecting a More Balanced View of Spent Fuel Pool Safety in NRC's Action Plan for Spent Fuel Pool Criticality Analysis

It is the industry's position that there is a strong basis for assuring the safety of spent fuel pools that is and will continue to be in effect as this Action Plan is being implemented. Accordingly, the Action Plan should reflect an appropriate balance between the need for enhanced guidance for Spent Fuel Pool (SFP) Criticality Analysis to address growing challenges in this area and the high confidence that exists in the safety of pools today. The Plan proposes developing additional guidance for the performance and review of SFP criticality analyses to reduce the reliance on engineering judgment. We believe that this engineering judgment is being exercised prudently within a sound and comprehensive regulatory framework that can be described as follows:

- Current NRC regulations contained in 10 CFR 50.68, "Criticality Accident Requirements," 10 CFR 70.24, "Criticality Accident Requirements," and 10 CFR 50 Appendix A, General Design Criterion 62, "Prevention of criticality in fuel storage and handling," provide adequate requirements for safe storage of spent nuclear fuel, including criticality. Licensees have safely maintained spent fuel storage pools for over 40 years, based on NRC-approved criticality safety analyses coupled with administrative controls. Each licensee that stores nuclear fuel in the SFP on-site is operating in accordance with the Technical Specifications (TSs), which are part of the Operating License issued by the NRC. Compliance with the TS, which include specific conditions regarding spent-fuel storage and criticality prevention, is subject to NRC inspection and enforcement.
- License Amendment Requests (LARs) for SFP modifications are being reviewed by the NRC in accordance with NUREG-0800, "Standard Review Plan for Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition." The acceptance criteria of NUREG-0800, Section 9.1.1, "Criticality Safety of Fresh and Spent Fuel Storage and Handling," are very comprehensive and contain detailed NRC review procedures including: review of computer models and validation studies, verification that the scope of normal and abnormal conditions described in the criticality analysis is comprehensive, confirmation that the conclusions are correct, etc.
- The NRC has recently issued LR-ISG-2009-01, "Aging Management of Spent Fuel Pool Neutron-Absorbing Materials Other Than Boraflex." This NRC guidance incorporates industry operating experience and recommends an aging management program (AMP) to address the potential loss of material (i.e., boral, carborundum, etc.) and loss of neutron-absorbing capability of these components during the period of extended operation. A license renewal applicant may reference this AMP in its license renewal application (LRA) to demonstrate that the programs at its facility are acceptable to the NRC for compliance with the License Renewal Rule. This guidance does not apply to Boraflex, for which Section XI.M22, "Boraflex Monitoring," of the Generic Aging Lessons Learned (GALL) Report describes adequate AMP characteristics. These monitoring programs ensure that the Boraflex sheets maintain their integrity and are effective in performing their intended function during the extended license

of the nuclear plant. LR-ISG-2009-01 requires the AMP to be implemented such that if there is any degradation of neutron absorbing material in the SFP, it is promptly detected and corrective actions are taken to prevent recurrence. The AMP includes inspections, testing, monitoring, analysis of criticality design to ensure that the 5% subcriticality margin is maintained, etc. The AMP is subject to the Quality Assurance (QA) Program that ensures that site QA procedures and administrative controls are implemented per 10 CFR 50 Appendix B. The AMP is subject to NRC inspection.

We are concerned that, as written, the Action Plan does not adequately recognize the level of safety that has been achieved in accordance with this regulatory framework. Therefore, we are recommending the following specific edits to convey a more balanced perspective:

- DESCRIPTION, first paragraph, first line, *"The conservatism/margins in spent fuel pool (SFP) criticality analyses have been decreasing. This is due to a confluence of factors."* Should be revised to read, *"The conservatism/margins in spent fuel pool (SFP) criticality analyses are being challenged by a confluence of factors."*
- DESCRIPTION, second paragraph, *"Recent license amendment requests (LAR) have not demonstrated the increased level of rigor in the analysis and questioning of assumptions the new complexity of the analysis and storage requirements warrant. NRC questioning of old assumptions has led the staff to believe several old assumptions are suspect in the new SFP criticality environment, including some contained in staff guidance."* Should be revised to read *"Recent license amendment requests (LAR) have not always included sufficient critical examination of assumptions to address the increased complexity of the new SFP criticality environment. NRC review of previous assumptions has led the staff to question several of these prior assumptions including some contained in staff guidance."*
- BACKGROUND,[1] fourth paragraph, fourth line, *"extensive degradation in the SFP racks at Palisades rivals that of BORAFLEX™"* should be revised to read *"degradation in the SFP racks at Palisades of a similar extent to that experienced with BORAFLEX™"*
- BACKGROUND, last paragraph, seventh line, "*Engineering judgment that may no longer be viable given the current methodologies employed in SFP criticality analyses. The basis for that engineering judgment is not documented, so its scope and intent cannot be confirmed."* Should be revised to read, "*The technical basis supporting this engineering judgement may need to be updated given the current methodologies employed in SFP criticality analyses so that its scope and intent can be more readily confirmed."*
- Problem Statement, first paragraph, third line, "*The use of engineering judgment, to the extend it was used in the past, is no longer unassailable since margins to criticality have been significantly reduced for reasons discussed above. Replacing regulatory guidance based on engineering judgment with guidance based on technically substantiated methods will*

[1] This comment is included as illustrative of the types of changes needed to reflect a more balanced approach. However, adoption of our overarching comment calling for the removal of "recent past events" from the plan, would lead to the deletion of any discussion of this issue.

improve regulatory certainty by placing the guidance on a firm footing". Should be revised to read, "*The use of engineering judgment, to the extent it was used in the past should be re-evaluated given that margins to criticality licensing limits have been challenged for reasons discussed above. Replacing regulatory guidance based on engineering judgment with guidance based on technically substantiated methods will improve regulatory certainty by placing the guidance on a firmer footing".* We believe that for PWRs the actual level of soluble boron in the pool adds real margin to criticality that is much larger than the issues raised. For BWRs, the margin between the actual burnup in the pool and limiting burnup assumed in the analysis is also larger than the issues raised. The industry is not at this time suggesting a change in the licensing practices but does not want to mislead the public on the real margin to criticality.

- Problem Statement, bullet #1, *"reduce the reliance on engineering judgment"* should be revised to read *"reduce the reliance on outdated engineering judgment".*